MANITOBA RESEARCH COUNCIL ANNUAL REPORT

1989
1990

MANITOBA
RESEARCH
COUNCIL
WHERE SCIENCE GETS DOWN TO BUSINESS.

LETTER

FROM

THE

CHAIR

91-05380/

June 30, 1990

Honourable J.A. Ernst
Minister
Industry, Trade and Tourism
Room 358, Legislative Building
Winnipeg, MB
R3C 0V8

Dear Mr. Ernst:

After another successful year of operation, during which thousands of businesses and entrepreneurs, as well as leading scientific research institutions such as the Canadian Space Agency and NASA, availed themselves of our invaluable consulting services, I am pleased to submit for your consideration, the Annual Report of the Manitoba Research Council for the fiscal year ended March 31, 1990.

R. Hood
Chairman

CORPORATE PROFILE

Working closely with industry, government and universities, the Manitoba Research Council (MRC) plays a lead role in encouraging and facilitating scientific research and technological development. As an agency of the Province of Manitoba, MRC also advises the government on developments in new technologies as they relate to the economic and social development of the province.

Through its operating units, MRC assists industry in the development and implementation of appropriate technology. MRC provides food technology services from its facilities in Portage la Prairie and engineering and environmental technology services from its Winnipeg facilities. MRC has co-operative initiatives with the University of Manitoba in both the Mechanical Engineering Department and the Food Science Department.

MRC's complement of services and capabilities is as follows:

ENGINEERING SERVICES
(Winnipeg)

- Electronic Design
- Equipment Retrofit
- Finite Element Analysis
- Mechanical Design
- Printed Circuit Board Layout
- Software Development
- Vibration Analysis
- Integrated Circuit Design
- Machine Design
- Material Engineering
- Physical Testing
- Prototyping
- Surface Mount Technology

ENVIRONMENTAL MONITORING AND ANALYTICAL CHEMISTRY SERVICES
(Winnipeg)

- Air Quality Monitoring
- Hazardous Waste Analysis
- PCB Analysis
- Transformer Gas Analysis
- Environmental Chemistry
- Leachate Testing
- Trace Metals and Organics
- Noise Analysis

FOOD TECHNOLOGY SERVICES
(Portage la Prairie)

- Product Feasibility Studies
- Ingredient Sourcing & Evaluation
- Recipe Development
- Colour, Viscosity & Texture Testing
- Quality Assurance Programs
- Plant Sanitation Audits
- Shelf-Life Studies
- Regulatory Compliance Assistance
- Product Formulation
- Consumer Preference Studies
- Process Development
- Test Market Production
- Nutrition Labelling Assistance
- Pesticide Residue Detection
- Chemical & Microbiological Assessments

TECHNICAL INFORMATION AND ADVISORY SERVICES
(Winnipeg and Portage la Prairie)

- Computer Data Searching
- Information Sourcing
- Interlibrary Loans
- Literature Searches
- Technical Evaluations

CO-OPERATIVE INITIATIVES

- University of Manitoba
  - Advanced Industrial Materials Program
  - Institute for Technological Development
  - Agri-Food Biotechnology Program
- National Research Council of Canada
  - Industrial Research Assistance Program
  - Research Institute Support Program

CHAIRMAN'S REPORT

Over the past several years, due in large part to the recognition that Manitoba has to compete in a global market place, government, industry and academia, jointly, have placed significantly greater emphasis on the need to adapt science and technology to improve the productivity and competitiveness of our industries.

In keeping with this need, and consistent with the recommendations of the previous Board, the Manitoba Government made major changes to the constituency of the Manitoba Research Council Board of Directors to include representation from the majority of the major industrial sectors of the Province.

MRC's three major thrusts have traditionally been in food technology services, industrial technology services and information advisory services, including delivery of the National Research Council of Canada's Industrial Research and Assistance Program. During 1989, MRC was also requested to re-establish its role as the Science and Technology Advisory Council to the Provincial Government. As a result MRC now represents the Province on the National Forum of Science and Technology Advisory Councils.

This expanded role now places MRC in a strategic position within the science and technology infrastructure of Manitoba. Toward this end, MRC has taken the initiative to develop linkages between the various components of Manitoba's science and technology community. The objectives of this action are to minimize duplication of effort, to maximize the benefit of the limited resources available, and to encourage partnerships among industry, government and the research institutions.

One of the first advisory accomplishments of the new Board was the development of a comprehensive set of science and technology policies to provide a long range framework for the enhancement of Manitoba's economy. The basic tenet of these policies is to build on our strengths and to take advantage of new opportunities. These policies have been recommended for adoption by the Provincial Government.

To fully benefit from the experience that new Board members can bring to the operation of MRC, three Board committees were established:

- The Finance Committee were mandated to implement the necessary systems for the effective monitoring by management and the Board of ongoing MRC operations.
- The Marketing Committee were directed to assess current marketing programs and to advise on the development of a new marketing strategy to maximize the benefit of MRC to the industrial community.

They have also been charged to plan and implement programs needed to create a greater awareness of the importance of science and technology to Manitobans.

- The Planning Committee have responsibility for the development of plans and programs that will enhance the effectiveness of the adaptation and utilization of science and technology by Manitoba Industry.

I wish to acknowledge the extensive time commitment made by all Board members in accepting the challenge of providing direction to MRC, and in developing the advisory role on science and technology to the Provincial Government.

On behalf of the Board, I would like to express our appreciation to all MRC staff for their dedication to building the Manitoba Research Council as a major source of technical assistance for industrial development and as a centre of excellence. I would also like to make special recognition of the contribution of Dr. Jim Reichert, Manitoba Department of Industry, Trade and Tourism, for his extensive assistance in advancement of MRC's science and technology advisory role.

In conclusion, I would like to express the appreciation of the Board to the Honourable J.E. Ernst, Minister of Industry, Trade and Tourism for his guidance and support in making the changes to accommodate the advisory role and in ensuring that the services provided by MRC are relevant to the future needs of Manitoba.

R. Hood
Chairman

PRESIDENT'S REPORT

One of the most significant events of the year was the appointment of a new Board of Directors for the Manitoba Research Council, representing all major industrial sectors in the province and including, for the first time, representation from the agriculture and resource sectors.

Important Board initiatives were the establishment of Marketing, Planning and Finance Committees to assist in developing a new and more relevant role for MRC. By year end, a strategic planning study had been initiated to develop plans and a vision for leading MRC into the next century.

Another important event during the year was expanding the scope of MRC to enable it to become the Science and Technology Advisory Council to the Province, in addition to its other roles. This expanded role strategically positions MRC within Manitoba's science community.

A consequence of the new advisory role was the identification of areas in which MRC could play an important part in influencing the growth of the science community in Manitoba. A first step in this regard was the provision of award medals to the Manitoba School's Science Symposium and the initiation of an MRC scholarship for the science fair project offering the most potential for commercialization. The winner of this year's scholarship was Mr. Jason Brown, a grade eleven student from Beausejour, Manitoba.

MRC continued to profit from its alliances with the other provincial research organizations. Noteworthy during the year was the opening of an Ottawa office for the Association of Provincial Research Organizations (APRO) and the hiring of an APRO Executive Vice-President. This initiative has significantly expanded the awareness of APRO within federal science and technology circles and has resulted in several joint projects among APRO members.

As is shown later in this report, MRC staff continued to play a prominent and important role within a number of groups and associations. As well, the technological competence of staff was recognized in a number of ways: The food chemistry department was awarded the prestigious Mid-Canada Award for competence by the Association of Official Analytical Chemists. Successful completion of a number of projects for industrial clients, in areas as diverse as new alloy development in zero gravity, wheelchair lifts for California buses, dobby control devices for the weaving industry in Pakistan and hybridoma technology applied to agricultural crops, once again illustrated the broad range of competence of our staff.

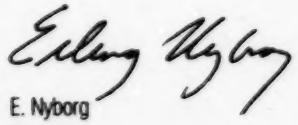
MRC continued to benefit from its close ties with the University of Manitoba, especially in food science and engineering areas. To illustrate the importance of this link during the year, MRC became one of ten industrial partners supporting a new NSERC industrial research chair in advanced manufacturing systems. This Chair will assist MRC in its manufacturing engineering activities with small and medium sized companies.

As well, the significant, continued support from the National Research Council of Canada, in supporting its Industrial Research Assistance Program through MRC, to provide Manitoba industry with a comprehensive range of technology transfer services, is once again recognized. The MRC/NRC partnership in providing these services is critical to MRC meeting its mandate within the Province.

During the year, MRC had total revenues of $5.763 million as compared to $5.421 million in 1988/89. Contract revenues were $2.837 million in 1989/90 as compared to $2.401 million in 1988/89. During 1989/90 over 10,000 contacts were made with industry and entrepreneurs in providing technical assistance and access to new technologies. Of these, 65% were for Winnipeg clients, 25% for clients in rural Manitoba and 10% for out-of-province clients. Sixty-three per cent of contract revenue was from industrial contracts, a three per cent increase over the previous year. During the year, revenue exceeded expenses by $173.0 thousand.

I once again wish to thank the Province for its continued support and commitment to MRC. I also wish to thank the MRC Board and especially the members of the Executive Committee – Russ Hood, John Ingraham, Bob Silver, George Ubell and Derek Johannson – for their continued support and hard work.

Finally, I wish to thank all MRC staff for their initiative, hard work and professionalism. It is only through their dedication that MRC will continue to meet its goals in serving the needs of Manitoba industry.



E. Nyborg
President

MRC SERVICES

The Manitoba Research Council provides industry and government with technical, information, advisory and contract services through its industrial and environmental technology facilities in Winnipeg, through its food technology facilities in Portage la Prairie and through joint-venture initiatives with the University of Manitoba and the National Research Council of Canada. Services include the sourcing of information on products, components and patents for local industry and entrepreneurs; the provision of advisory services to address specific technical problems facing industrial clients; and conducting projects on a contract basis for industrial and government clients in Manitoba, other parts of Canada and the world.

MRC also assists companies in testing their products for compliance to many national and international standards and regulations. MRC is accredited by the Standards Council of Canada for a large range of mechanical, physical, chemical and metallurgical tests. Specialized testing programs can be developed to suit specific clients needs.

ENGINEERING SERVICES

The Manitoba Research Council provides engineering services to Manitoba, national and international clients, in product design, product development and testing from its Winnipeg facilities. MRC helps industrial clients increase their efficiency and productivity and provides assistance at all stages of the product development cycle, from concept evaluation to test market launch. By using MRC's professional and integrated services in mechanical engineering, electronics, materials science and computer-aided engineering, Manitoba companies can become more competitive regionally, nationally and internationally.

ELECTRONICS ENGINEERING

Electrical and electronics engineering provides design, product development assistance and general consulting services. Design services include electronic circuit design, printed circuit board design, communications systems design and industrial applications. Product development services include product selection assistance, product testing, evaluation and electronic retrofitting of manufacturing equipment.

MECHANICAL ENGINEERING

Mechanical engineering provides specialized product design and analysis services. Technical capabilities include functional analysis, structural integrity assessments, system dynamics studies and evaluations of safety and cost effectiveness. Specialized services are available in vibration analysis, noise control, finite element analysis, solids modelling and computer-aided engineering.

ADVANCED INDUSTRIAL MATERIALS PROGRAM

This is a co-operative initiative of MRC and the Department of Mechanical Engineering at the University of Manitoba. There are three elements: joint research and development; joint technology transfer in the field of metallurgy and materials science; and advisory services to industry. The R&D component includes work in the field of advanced industrial materials such as rapidly solidified alloys, superalloys, new steels, plastics, ceramics, and composites. The program's objectives are to improve the productivity of the manufacturing sector using or producing these materials, and to assist Manitoba companies in adopting new materials or processes.

ENVIRONMENTAL MONITORING AND ANALYTICAL CHEMISTRY SERVICES

Through our Winnipeg facility, a wide range of chemical and environmental services are provided to industry. Capabilities include industrial and hazardous waste analysis, workplace air quality monitoring, fuels and lubricants testing, transformer gas analysis, contaminant identification, specification verification, micro-organism identification, formula review, quality control testing and process evaluation. These, combined with our Engineering Services, also make MRC extremely well-positioned to assist companies seeking to capitalize on the growing interest in sustainable development technologies and products.

FOOD TECHNOLOGY SERVICES

The Manitoba Research Council provides food technology services to Manitoba, national and international food, feed and beverage industries through its facilities in Portage la Prairie. MRC provides clients with access to an integrated research, product development, testing and a pilot-scale production facility. It offers clients the expertise and experience of a dedicated team of food scientists, engineers, technicians and consultants, the resources clients need to develop new and better products, and more cost-effective production techniques.

FOOD PRODUCT DEVELOPMENT

Product development activities range from turning an idea into a new food product to finding uses for by-products. Expertise and equipment are available to conduct flavour, colour and texture analyses as well as sensory evaluation to suit home, restaurant and institutional food requirements.

FOOD ENGINEERING

Food Engineering services include consulting assistance in process development and optimization, equipment specification and selection, plant layout and design, and energy conservation.

PILOT PLANT

The pilot plant is equipped and serviced for production of new food products on a trial basis. Technical skills and equipment are available to assist with process development in the areas of dairy and meat products, fruit and vegetables, and cereal technology (including baking). Processing capabilities include cooking, blanching, freezing, battering and breading, drying and membrane separation. The pilot plant is Meat Hygiene Directorate inspected so test products containing meat can be distributed interprovincially and internationally.

MICROBIOLOGY

Microbiological laboratories are equipped to evaluate food for spoilage and pathogenic organisms. Facilities for both enumeration and identification are available on site. Services also include consulting assistance in food plant sanitation and microbiological procedures.

FOOD AND ANALYTICAL CHEMISTRY

Chemical analysis services range from routine protein, fat and moisture determination to sophisticated tests for trace constituents and contaminants, such as vitamins and pesticides. In addition to a well-equipped wet chemistry facility, instrumental capabilities include gas chromatography with flame ionization, nitrogen-phosphorous, and electron capture detectors. High Pressure Liquid Chromatography capability includes gradients, computer workstation and refractive index, variable wavelength UV and spectrofluorescence detectors.

AGRI-FOOD BIOTECHNOLOGY PROGRAM

Is a co-operative initiative of MRC and the Department of Food Science at the University of Manitoba. The purpose of this biotechnology initiative is the development of new agri-food products that are based on monoclonal antibody technology. Areas of interest include food safety, food toxicology and development of identification techniques. Located on the University campus, this initiative draws on the expertise of MRC food technology personnel as well as faculty members of the Food Science Department.

SPECIALIZED TESTING SERVICES FOR THE FOOD INDUSTRY

MRC is accredited by the Standards Council of Canada for a range of specific chemical and microbiological tests of importance to the food industry. Specialized testing programs can be developed to suit specific client needs.

TECHNICAL INFORMATION AND ADVISORY SERVICES

The Manitoba Research Council offers technical information and technological advice to Manitoba industry. This program includes information and advisory services funded by the Province and by two contribution agreements with the National Research Council of Canada for the delivery of the Industrial Research Assistance Program (IRAP); and the Research Institute Support Program (RISP). Through these services and programs, MRC helps industry solve technical problems, improve productivity, and introduce new materials, equipment and technology. There is no charge to industrial clients for services under this program. Available assistance includes: on-site technical problem definition and solution development; library services; literature and database sourcing; information on the availability of government assistance programs; demonstrations of PC and mainframe-based CAD/CAM systems; and technical advice to the Regional Development Corporations and other government departments.

Information services are available through MRC's library facilities in Portage la Prairie and Winnipeg. These services provide industrial clients with access to extensive holdings of books, journals, catalogues, standards and government regulations. In addition, world-wide information is available through computer access to more than 300 technical databases. MRC's library staff assists clients in accessing these materials directly or through IRAP.

INSTITUTE FOR TECHNOLOGICAL DEVELOPMENT (ITD)

Is a co-operative venture among the Manitoba Research Council, the National Research Council, the University of Manitoba and Manitoba industry. The primary objectives of the ITD are to encourage communication between industry and university researchers, to facilitate technology transfer from the University to local industry, and to support co-operative R&D to improve the competitiveness of local industry. ITD performs a variety of technology transfer and networking activities to meet these goals.

1989/90

HIGHLIGHTS

ENGINEERING SERVICES

- MRC participated in the NASA space program performing solidification experiments with metal alloys in microgravity aboard the KC-135 at NASA, Houston, Feb. 1990.
- MRC continues to work with the Canadian Space Agency developing apparatus and techniques to study the solidification behaviour of metal alloys aboard a Sounding Rocket.
- MRC is developing a special coating for diesel engine liners on behalf of Transport Canada.
- In conjunction with Motor Coach Industries, a modular wheelchair lift was developed for use on their intercity coaches. Our involvement included concept development, detailed design, prototype parts manufacture and verification testing.
- A contract research project aimed at developing suitable vibration criteria for purchasers of diesel electric generating sets larger than 100 kw capacity was undertaken on behalf of the Canadian Electrical Association and Manitoba Hydro.
- Assistance was provided to Manitoba Hydro in solving a vibration problem in towers in the province's main HVDC transmission line. A high percentage of the towers were found to have fatigue failures at the same joint in a secondary member. The fatigue was thought to be caused by wind induced conductor vibration exciting resonances in the tower structure. A combination of finite element analysis and dynamic testing was used to model the tower and to develop a suitable bracing system to alleviate the problem.
- A program to monitor three groundwater source heat pump installations in Manitoba continued. This program is co-sponsored by the Canadian Electrical Assoc., Energy Mines and Resources Canada, Manitoba Energy and Mines and Manitoba Hydro.
- The Transportation Development Centre commissioned a project to evaluate the feasibility of the application of multiplexing to intercity coaches. This study includes the assessment of industry practices, system design and cost benefit analysis.
- A project was undertaken to retrofit an infra-red grain analyzing system used to evaluate grain quality by protein, oil and moisture content. The existing hardware was replaced by a PC AT compatible computer, and the existing software modified to account for adding testing features and improving functionality.
- A project was undertaken for a local manufacturer to test a van for roll-over protection to Motor Vehicle Safety Test Methods (MVSTM) Section 220. The van had been modified and fitted with a fiberglass top.
- A program was undertaken to evaluate the static coefficient of friction for a number of floor surface and shoe material combinations which had been treated with a special compound.
- A project involving component design, test equipment design ad vibration testing for disc drive cabinets was undertaken for a local company.
- A technical evaluation on a recreational pedal boat was completed for a local entrepreneur. Funding was supplied by the Native Economic Development Program. The study included detail component design, prototype manufacture and testing.

ENVIRONMENTAL MONITORING AND ANALYTICAL CHEMISTRY SERVICES

- Provided analytical services for a research project on the migration of pentachlorophenol from treated wood posts through various soil types and profiles.
- Conducted a research project on the suitability of several plastics for use as recyclable containers for pesticides.
- Provided industrial hygiene services to a number of clients, including welding and maintenance shops, foundries, a scrap yard, printer, schools, and several offices suffering from sick building syndrome.
- Developed and documented a method for the analysis of plasticizer residues in human blood serum on request of client.
- Provided analytical services to a number of companies to assist them in reducing or eliminating the generation of hazardous wastes.
- Provided emergency analytical support in response to environmental concerns over PCB spills.
- Maintained the laboratory's proficiency rating in the National Institute for Occupational Safety and Health Proficiency Analytical Testing Program.
- Determined the extent and type of contamination present in the soil and groundwater from an old refinery site.
- Participated in a study to determine the environmental persistence of a pesticide used to control mosquito population in the Northwest Territories.

FOOD TECHNOLOGY SERVICES

- A value-added poultry product was developed for a Manitoba processor. Preliminary consumer feedback received by the processor indicate strong acceptance of the product.

- A food service operation wishing to market one of their products to the HRI trade was assisted with formulation refinement, packaging selection and shelf-life testing. Plans for test marketing are underway.
- A line of confectionery products was developed for a Saskatchewan company. The company plans to market the products at the retail level.
- A snackfood manufacturer sought assistance with developing a condiment complementary to their main product line. It is anticipated test market production of the condiment will be undertaken by MRC in the near future.
- A national bakery company used MRC facilities to provide a four-day course in bakery production and retailing.
- Production of several products for retail sale took place during the year in MRC's food pilot plant: a cocktail mix, frozen novelty, raspberry juice, fruit preserves, fish burgers, pizza crust and sauce.
- Goat's milk continued to be pasteurized and packaged in the pilot plant for a large Manitoba goat farm. The milk is distributed in Manitoba, Saskatchewan and Northwestern Ontario.
- Pre-browning of breaded chicken products to supply an Ontario test market was undertaken throughout the year for a Manitoba processor.
- Retail packaging of food products in the pilot plant continued with the packaging of various products, including President's Choice brand of chicken wings.
- Comprehensive testing for products of the Manitoba Liquor Control Commission continued, as the main thrust of their quality control program.
- Honey from several producers in Manitoba and Saskatchewan was tested for antibiotic and bee repellant residues. Certification for compliance with residue limits is necessary to sell or export honey.
- MRC performed nutrition testing on a wide variety of food products to help manufacturers with U.S. and Canadian labelling legislation.
- MRC provided testing assistance to dairy product inspectors by analyzing "cheese" samples for cholesterol and plant sterols to help identify imitation cheese.
- Processing trials on Manitoba-grown vegetables showed that frozen Manitoba vegetables compared very well with product available on the retail market.
- Fish sticks provided by an out-of-province client were breaded and battered for a pilot market production run.
- In conjunction with a private sector consulting firm, fermentations were conducted to assess ethanol production in grain by-products.
- Using specialized air monitoring equipment, the microbiological quality of air in processing and business establishments was monitored for pathogenic organisms. This is a new MRC service.
- Monitoring of meat, dairy and other food products for spoilage and pathogenic bacteria was provided to companies to ensure product integrity and safety. Of the pathogens, Listeria and Salmonella are of prime concern to the food industry.
- MRC assisted in the development of a quality control program for a new Manitoba-based food processing firm. MRC initially performed all micro analyses for the company but, with advice and training, the firm is able to effectively conduct their own quality control.

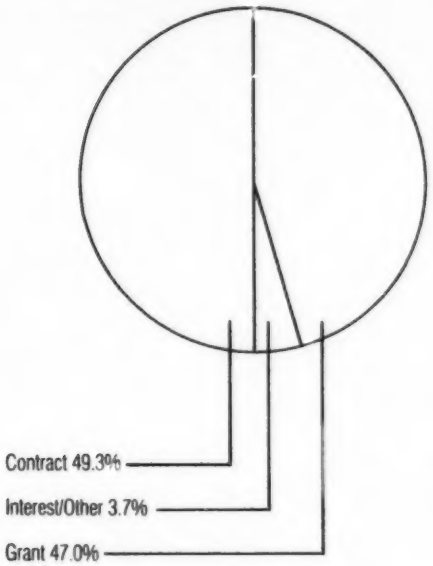
TECHNICAL INFORMATION AND ADVISORY SERVICES

- A small local food service company specializing in the production of lasagna identified a need to reduce costs and improve product packaging. With IRAP help, alternative and less expensive sources of ingredients were identified and assistance was provided in the identification and procurement of packaging materials. This has resulted in significantly reduced costs of production.
- A local firm with a concern related to a post-tensioned concrete structure wanted to know if there was a non-destructive method for ascertaining the integrity of the structure and its elements when performing annual inspection. Standard testing methods risk causing failure to the element being tested. Another method of testing which holds considerable promise was identified for the client and, in addition, a new technology was suggested for improving the alternative method of testing.
- A manufacturer of bulk shipping bags began experiencing failures in the power supplies for their hot-wire fabric cutting equipment. Assistance was provided in diagnosing the cause of the problem (a heating element material substitution had been made) and the selection and sizing of a more suitable alternative heating element material. In addition, a method was recommended for re-connecting the system which would enable the company to operate more hot-wire cutters from a single power supply. The company is now benefitting from significant reductions in equipment down-time as well as savings in the costs of replacement power supplies.

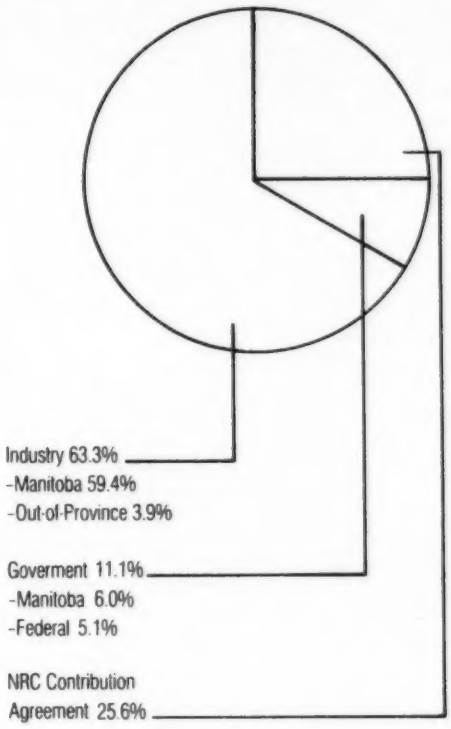
FINANCIAL SUMMARY

INCOME	1989/90	1988/89
Contracts	$2,836,748	$2,400,618
Grant from Province of Manitoba	2,711,400	2,862,400
Interest/Other	157,900	157,968
Capital Gain	57,000	—
Expenses		
Operating	$5,928,540	$5,757,236
Appropriation from Reserves for Depreciation Commencement	(388,922)	(335,876)
Net Revenue	$173,430	$ (374)

SOURCES OF REVENUE 1989/90



SOURCES OF CONTRACTS 1989/90



AUDITOR'S REPORT

THE MANITOBA RESEARCH COUNCIL
REPORT OF THE PROVINCIAL AUDITOR'S OFFICE

We have examined the financial statements, being Exhibits A, B, C and D and Schedule 1, of The Manitoba Research Council for the fiscal year ended March 31, 1990. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, the financial statements present fairly the financial position of The Manitoba Research Council as at March 31, 1990 and the results of its operations and the changes in its cash resources for the year then ended in accordance with the accounting policies stated in note 2 to the financial statements applied on a basis consistent with that of the preceding year.

F.H. Jackson, CA,
Provincial Auditor.

June 6, 1990,
Winnipeg, Manitoba.

EXHIBIT A

Balance Sheet as at March 31, 1990
(with 1989 figures for comparison)

Assets	1990	1989
Current:		
Cash	$ 7,000	$ 7,000
Funds on deposit with the Minister of Finance:		
Trust accounts	177,993	238,461
Term deposits	1,174,514	1,119,333
	1,352,507	1,357,794
Accounts receivable and accrued revenue:		
Government of the Province of Manitoba	585	19,372
Other, net of allowance for doubtful accounts of $69,623 (1989 - $8,386)	399,859	367,740
	400,444	387,112
Prepaid expenses	57,966	33,363
Building held for resale	-	80,000
	1,817,917	1,865,269
Fixed (Notes 2c and 3)	1,340,813	1,555,794
	$3,158,730	$3,421,063
Liabilities and Fund Balances		
Current:		
Accounts payable	$ 259,052	$ 348,325
Current portion of loan payable	15,755	13,320
Advances on contracts	6,177	425
	280,984	362,070
Loan payable (Note 5)	40,830	56,585
	321,814	418,655
Funds retained for future operations, Exhibit B	1,883,538	1,710,108
Reserve for commencement of depreciation policy, Exhibit C (Note 7)	953,378	1,292,300
	$3,158,730	$3,421,063

EXHIBIT B

Statement of Revenue and Expenditures and Funds Retained for Future Operations for the year ended March 31, 1990 (with 1989 figures for comparison)

	1990	1989
Revenue:		
Grants from the Government of the Province of Manitoba	$2,711,400	$2,862,400
Contracts	2,836,748	2,400,618
Interest	152,251	120,441
Gain on sale of building	57,000	—
Sundry revenue	5,649	37,527
Total revenue	5,763,048	5,420,986
Expenditures, Schedule 1	5,928,540	5,757,236
Results of operations - excess of expenditures over revenue	(165,492)	(336,250)
Appropriation from Reserve for commencement of depreciation policy	338,922	335,876
Net change for the year in Funds retained for future operations	173,430	(374)
Funds retained for future operations, beginning of year:		
As previously reported	1,710,108	1,630,482
Adjustment re change in accounting policy	—	1,708,176
As restated	1,170,108	3,338,658
Transfer to establish Reserve for commencement of depreciation policy	—	(1,628,176)
Funds retained for future operations, end of year	$1,883,538	$1,710,108

EXHIBIT C

Reserve for Commencement of Depreciation Policy (Note 7) for the year ended March 31, 1990 (with 1989 figures for comparison)

	1990	1989
Balance, beginning of year	$1,292,300	—
Transfer from Funds retained for future operations	—	$1,628,176
Transfer to Funds retained for future operations	338,922	335,876
Balance, end of year	$ 953,378	$1,292,300

EXHIBIT D

Statement of Changes in Cash Resources
for the year ended March 31, 1990
(with 1989 figures for comparison)

	1990	1989
Operating activities:		
Excess of expenditure over revenue before appropriation	$ (165,492)	$ (336,250)
Items not involving cash:		
Depreciation	384,557	373,275
Loss on sale of fixed assets	2,586	–
Gain on sale of building for resale	(57,000)	–
Net change in non-cash working capital balances:		
Accounts receivable	(13,331)	(66,471)
Prepaid expenses	(24,603)	(8,165)
Accounts payable	(83,521)	(37,127)
	43,196	(74,738)
Financing activities:		
Loan repayment	(13,319)	(10,641)
Investing activities:		
Fixed asset additions	(173,221)	(300,893)
Proceeds from disposal of building for resale	137,000	–
Proceeds from disposal of fixed assets	1,057	–
	(35,164)	(300,893)
Decrease in cash and funds on deposit	(5,287)	(386,272)
Cash and funds on deposit, beginning of year	1,364,794	1,751,066
Cash and funds on deposit, end of year	$1,359,507	$1,364,794

SCHEDULE 1

Schedule of Expenditures for the year ended March 31, 1990 (with 1989 figures for comparison)

	1990	1989
Expenditures (Note 5):		
Advertising and promotion	$ 229,666	$ 89,068
Bad debts	61,237	5,591
Building maintenance and repair	61,278	65,618
Computer related expenses	142,661	159,112
Depreciation	384,557	373,275
Equipment – rentals, maintenance and repair	81,034	106,203
Fees – memberships, seminars, customs and audit	86,642	58,135
Heating and utilities	99,615	90,374
Interest on loan	8,646	11,370
Laboratory supplies	252,982	264,310
Library – consultants and publications	59,216	45,404
Miscellaneous	15,298	1,565
Postage, delivery and telephone	138,049	137,158
Printing and stationery supplies	107,653	78,134
Purchased testing services	67,905	96,761
Real estate rental and property taxes	250,338	282,483
Salaries and employee benefits	3,728,492	3,702,831
Staff transfer and relocation costs	275	16,500
Travel and transportation	152,996	173,344
Total expenditures, Exhibit B	$5,928,540	$5,757,236

Notes to Financial Statements for the year ended March 31, 1990

1. Nature of Operations

The Manitoba Research Council was established in 1963 with the following objectives:

a) to promote and carry on research and scientific enquiries respecting agriculture, natural resources, industry or other segments of the economy of the province; and

b) to secure for Manitoba the benefits of research and scientific enquiries carried on elsewhere.

The Manitoba Research Council operates two laboratory facilities, one in Winnipeg and the other in Portage la Prairie.

2. Significant Accounting Policies

a) These financial statements are prepared on an accrual basis of accounting.

b) Revenue from the majority of contract work is recognized on the percentage-of-completion method which recognizes revenue as a contract progresses. Unbilled revenues are accrued to the year end for these contracts, while pre-billed revenues received are classified as deferred revenue.

Revenue from analytical lab work, involving shorter term contracts without substantial outlays of direct costs, is recognized on a completed contract basis.

c) Fixed assets are recorded at cost, less applied grant funds and accumulated depreciation. Depreciation is calculated on a straight-line basis at the following rates:

Automobiles	20%
Computer equipment	20%
Equipment	10%
Furniture and fixtures	10%

d) Certain general and administrative services and facilities are provided by the Province of Manitoba at no cost to the Council. These costs are not reflected in the financial statements. (Note 4)

Notes to Financial Statements
for the year ended March 31, 1990

3. Fixed Assets

Automobiles	$
Computer equipment	
Equipment	
Furniture and fixtures	

4. Administrative Expenditures

The Government of the Province of Manitoba inc
on behalf of the Council, including rent for Coun
land located in Portage la Prairie. This property w
Council, but was transferred in 1986 to Manitoba
compensation, thereby reducing Council's fixed
Following this transfer, annual rent is paid by the

5. Loan Payable

The loan payable to Winfield Development Ltd., r
bears interest at 14.25% and is repayable in blen
of $1,827. Principal repayments to maturity are a

1991	
1992	
1993	
1994	
Less: Current portion	

6. Pension Plan

In accordance with provisions of The Civil Service Su
of the Council are required to contribute to The C
Fund at prescribed rates for defined benefits. Co

7. Reserve for Commencement of Depreciation

The Board of Directors has approved the establis
entitled "Reserve for commencement of depreci
was established by appropriating an amount of $
retained for future operations. Each year, by mot
amount will be transferred to Funds retained for

8. Comparative Figures

Comparative figures for the year ended March 31,
conform with the presentation adopted for the cu

Cost	Funded by Government of Canada	Accumulated Depreciation	Book Value
20,000	$ 20,000	$ —	$ —
462,110	552,053	686,004	224,053
313,175	1,840,508	1,374,167	1,098,500
101,275	53,516	29,499	18,260
896,560	$2,466,077	$2,089,670	$1,340,813

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s certain expenditures
s building and related
previously owned by
roperties Inc. without
ets by $1,202,321.
ovince of Manitoba

to Manitoba Properties Inc. For 1990, rental and other administrative expenditures incurred by the Province are estimated to be $105,100 (1989 - $78,500). (The 1990 figures are composed of the following: rental for the Portage la Prairie property - $74,400; rental for other leased property in Winnipeg, which is normally paid by Council but which was waived in 1990 - $26,600; administrative expenses - $4,100.)

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turing May 1, 1993,
d monthly installments
ollows:

15,755
17,340
19,900
3,590
56,585
15,755
10,830

If the Council fails at any time prior to May 1, 1993 to be the tenant or subtenant of the premises, the unpaid principal and accrued interest shall become due and payable immediately.

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annuation Act, employees
Service Superannuation
il is required to make

contributions equal to the amount contributed to the Fund by employees. For 1990, the amount contributed by Council was $169,175 (1989 - $174,799). Under this Act, Council has no further pension liability.

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olicy

nent of a reserve to be
n policy". The reserve
$28,176 from Funds
of the Board, an
ure operations from the

Reserve for commencement of depreciation policy. The amount of the transfer is intended to be equivalent to the depreciation calculated for the year on fixed assets recorded as of April 1, 1988, when the new fixed asset accounting policy was adopted. However, the transfer may be in such other amounts as the Board determines to be appropriate.

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89 have been restated to
nt year.

PUBLICATIONS, PAPERS AND PRESENTATIONS

- Billiaderis, C.G. and Zawistoski, J. 1990. Viscoelastic behaviour of ageing starch gels, Cereal Chemistry (In Press).
- Lypka, G. "Investigating Indoor Air Quality Problems" - Manitoba Federation of Labour Occupational Health Centre Seminar Series Oct. 1989.
- Lypka, G. "Sampling and Analysis of Hazardous Wastes" presented to members of the On Site program, sponsored by Energy Pathways Inc. and Employment and Immigration Canada, Sept. 1989.
- Porter, C., Berzl, A., Frolich, A., Marquardt, R., Dawood, M., and Zawistoski, J. "Detection of Ochratoxin A in contaminated grains using monocloural antibodies" presented at Canadian Institute of Food Science and Technology - 32nd Annual Conference, Quebec City, June 1989.
- Shambrock, D. "Career Opportunities in the Food Industry" presented at the Student Night of the local chapter of the Canadian Institute of Food Science and Technology, January, 1990.
- Smyrl, T. "How Organizations Can Develop New Food Products" presented at the Fifth Annual Educational Seminar of the Manitoba Branch of the Canadian Institute of Public Health Inspectors, May, 1989.
- Sullivan, V. "Challenges Facing Small Processors" presented at the Food Product Development One-Day Workshop sponsored by the University of Saskatchewan and Saskatchewan Agriculture, March, 1990.
- Tandon, K.N. "Gas Turbine Materials" a course delivered to the plant engineers/technologists at Standard Aero Ltd., Oct. Dec. 1989.
- Tandon, K.N. and Begin, J. "Study of Variation in the Natural Frequency of Steel Castings Containing Porosity and Inclusions" accepted APPLIED ACOUSTICS, 1989.
- Tandon, K.N., Cahoon, J.R., and M.C. Chaturvedi. "Development of an equipment and technique to study the directional solidification in microgravity" presented at the Canadian Aeronautics and Astronautics Society meeting, Ottawa, November, 1989.
- Tandon, K.N., L. Collins and Cahoon, J.R. "Corrosion Fatigue Behaviour of Magnetic Metallic Glasses" Canadian Metallurgical Quarterly, Vol 29, pp 167-170, 1990.
- Zawistoski, J., "Advanced Testing Methods - ELISA" presented at the Food Microbiology - Short Course organized by Food Science Dept., U. of M., April 1989.

STAFF AND CORPORATE MEMBERSHIPS

During the year MRC staff have been involved on various boards, committees and working groups associated with the following organizations.

American Library Association
American Association of Cereal Chemists
American Conference of Governmental Industrial Hygienists
American Industrial Hygienists Association
American Society for Metals
American Society for Microbiology
American Society of Agricultural Engineers
Association of Consulting Engineers of Manitoba
Association of Official Analytical Chemists
Association of Professional Engineers of Manitoba
Association of Professional Engineers of Ontario
Association of Profesional Engineers of Saskatchewan
Association of Provincial Research Organizations
Biomass Energy Institute
Canadian Advanced Industrial Materials Forum
Canadian Association of Special Libraries and Services
Canadian Home Economics Association
Canadian Food Services Executives Association
Canadian Industrial Innovation Centre
Canadian Institute of Food Science and Technology
Canadian Institute of Industrial Technology
Canadian Library Association
Canadian Manufacturers Association
Canadian Research Management Association
Canadian Society for Plant Molecular Biology
Canadian Space Agency
Canadian Standards Association
Canada Wide Science Fair
Chemical Institute of Canada
Electronics Industry Association of Manitoba
Environmental Choice Management Board, Environment Canada
Food Institute of Canada
Furniture West
Grain Elevator and Processing Society
Home Economists in Business
Human Resources Management Association of Manitoba
Institute of Food Technologists
International Association of Milk, Food and Environmental Sanitarians
Manitoba Association of Home Economics
Manitoba Association of Library Technicians
Manitoba Chamber of Commerce
Manitoba Fashion Institute
Manitoba Food Science Lead Committee
Manitoba Home Economics Association
Manitoba Homebuilders Association
Manitoba Institute of Agrologists
Manitoba Library Association
Manitoba Schools' Science Symposium
Manitoba Society of Certified Engineering Technicians & Technologists Incorporated
Manitoba Trucking Association
Minister's Advisory Council on CGSB
Minister's National Advisory Council to CANMET
National Association of Corrosion Engineers
National Research Council
Natural Sciences and Engineering Research Council
Networks of Centres of Excellence
Ordre des Chemistes du Quebec
Packaging Association of Canada

Prairie Implement Manufacturers Association
Product Development Management Association
Red River Community College
Society of Manufacturing Engineers
Solar Energy Society of Canada Inc.

Standards Council of Canada
Statistical Association of Manitoba
University of Manitoba
Winnipeg Business Development Corporation
Winnipeg Chamber of Commerce

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Vice-President, Operations
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